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3.	Full name, address and postcode of the or of each applicant (underline all surnames)	INTELLPROP LIMITED 12 OCT 2002 0223791.5 National Westminster House Le Truchot St Peter Port Guernsey, British Channel Islands		
	Patents ADP number (if you know it)	06894604002		
	If the applicant is a corporate body, give the country/state of its incorporation	UK		
4.	Title of the invention	Telecommunications Services Apparatus		
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		GB	0206985.4	25.03.2002
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## TELECOMMUNICATIONS SERVICES APPARATUS

### Field of Invention

This invention relates to Telecommunications Services Apparatus, and particularly concerns telecommunication networks and the text messaging services of mobile telephone networks. The invention particularly concerns text messaging to SMS Hosts, bulk text messaging, premium rate text messaging and value added services for text.

### Background of the Invention:

In GSM the Short Message Services (SMS) allow Mobile Stations (MS) to send short text messages. The messages are normally routed via a Short Message Service Centre (SMSC) that provides a store and forward function. The SMSC attempts to deliver the message to its destination which may be another MS or a host address in the same or another network. In GSM, the prevalent use of an SMSC in the delivery of each Short Message follows the original intention of the GSM specifications, which assumed that initially radio coverage would be patchy, battery life would be poor, and for these and other reasons phones would be frequently unreachable. With the maturity of the technologies, over 80% of text messages are now deliverable on the first attempt in some networks, and the overhead and extra delay incurred by transiting an SMSC is becoming undesirable for many types of service that use SMS.

Text messaging has undergone enormous growth because it fulfils a basic communication need, complementing voice communication with the ability to send and receive short text messages.

The term 'Text messaging' is taken herein as a generic term that includes similar forms of messaging including SMS, EMS, MMS and the like.

Text messaging in GSM, using SMS, was primarily aimed at handset-to-handset communication, or network to handset communication for the purpose of alerting. The extensive use today for communication gives rise to a need for associated services that allow text messages to be exchanged with machines. This has given rise to SMS Hosts, which are equipments or Applications attached to networks and which can source and terminate SMS.

SMS Hosts are used for a wide variety of purposes including voting, competitions and Interactive TV. By their association with mass media and their appeal to the general public, some SMS applications can generate very high volumes of SMS traffic between users and SMS Hosts. In many cases this has led to overloading of existing SMSC-based infrastructure and a reduction in quality of service for all users. In many cases overload has resulted in large numbers of messages being discarded by some networks even though they may have already been charged for.

One high growth area for SMS is premium rate services, which in conjunction with SMS Host-based applications are increasingly showing potential to generate significant revenue for operators. Typical examples of premium rate services that attract high levels of traffic are television-stimulated voting and sports results during national and international events. In many ways the growth of this premium rate market for SMS has parallels with the premium rate voice market which grew and then faded in the late 1980s and early 1990s. In many countries, premium rate voice services were closed down either due to regulator intervention or media pressure, the bad publicity being generated by unscrupulous and fraudulent usage of premium charges by some third-party service providers that were not directly associated with the network operators.

Premium rate SMS is in danger of suffering many of the same problems as premium rate voice due to the proliferation of a billing technique known as Reverse Billing.

5 There are essentially three ways to bill for a text-based value added service:

1. A network or third-party SMS Host can charge an up-front subscription for one or more text messages to be delivered to a mobile telephone number from an SMS Host application.
- 10 2. A network can charge a premium upon receipt by the network of a mobile originated (MO) message from a mobile telephone number that is addressed to a network or third-party SMS Host application.
- 15 3. On receipt of a message from a mobile telephone, a network or third-party SMS Host application can reply with a mobile terminated (MT) message, and the network may be instructed by the SMS Host to charge the mobile telephone account a premium for that reply. This is known as Reverse Billing.

20 The latter solution is prevalent in mobile networks, but is open to abuse and fraud. There have already been many cases of fraudulent use of reverse billing reported in the press. Because it is the reply that is charged at a premium, users may easily be duped into responding to an innocent looking text message or advertisement thereby triggering a reply charged at a premium rate, to later find that they have been charged a hefty fee. The problem with reverse billing is that it is the service provider rather than the network operator who is responsible for initiating the charge, and so there

is a built-in incentive for fraud. If this situation is allowed to continue, then users will become distrustful of SMS; premium rate SMS will then go the same way as premium rate voice, and the networks will lose out on a valuable source of revenue.

- 5 In contrast, premium rate billing of MO messages is, we believe, the correct way to operate value added services. With this technique the user is charged for originating a message, and is not charged for any reply. The charging can then be made transparent. Ideally the numbering plan for premium rate SMS and short codes would indicate the charge bands as is  
10 done on many fixed networks for premium rate voice.

#### Summary of the Invention

- According to one aspect of the invention we provide a telecommunications services apparatus capable of processing text messages some of which are addressed to an SMS Host, as hereinbefore defined, capable of terminating  
15 high volumes of text messages, the apparatus being provided with one or more SMS routers to which all incoming text messages are passed, a first path being provided between the SMS routers and the SMS Host, and an alternative path being provided between the SMS routers and other destinations, the SMS router/s being configured to recognise incoming text  
20 messages to one or more specified SMS Hosts and to be operative to direct such text messages to the SMS Host by way of the first path, and without passing via an SMSC.

The alternative path may be provided with a short message service centre (SMSC) for delivery.

- 25 The first path preferably has a relatively high band width compared with the band width of the alternative path.

According to a second aspect of the invention we provide a method of managing text messages in a telecommunications services apparatus comprising determining from the attributes of a text message whether or not the text message is of a specified character appropriate to be received  
5 by an SMS Host, and if the message is determined to be of that character, directing the text message by a first path to the SMS Host, but otherwise directing the message to a destination by way of an alternative path.

The present invention works by a technique that is likely to become known as 'grooming'. Prior to arrival at the SMSC, short messages are groomed  
10 by an SMS Router. The network is arranged so that all mobile originated (MO) short messages pass through an SMS Router prior to arriving at an SMSC in the network.

SMSCs that comply with the GSM specifications are required to limit the delivery of messages to any given number to around one message per  
15 second, which is much too slow for mass-messaging events, where several thousand messages per second may be sent. Consequently, when SMSCs are used for mass messaging applications, queues build up in the SMSCs very quickly, ultimately resulting in long delays and discarded messages.

The SMS grooming approach of the invention avoids this problem by  
20 extracting those message that are destined for SMS Host applications and passing those messages unimpeded directly to the SMS Hosts.

In this way enormous message bandwidth can potentially be achieved, and the message delivery path need no longer be a bottleneck that restricts the growth of new services, hence providing the capability for true premium  
25 rate messaging.



A billing record generation means is preferably so arranged as to be capable of applying a premium charging rate to text messages received by an SMS Host.

5 A known technique, usually called Virtual mobile, may be applied in conjunction with the present invention. This allows mobile originated messages from any network to be delivered to an SMS Host on a network that supports Virtual Mobile. Without this technique, an SMS Host would need a separate interconnect to the SMSCs of every network from which it desires to receive SMS traffic.

10 According to a third aspect of the invention we provide a machine readable storage medium encoded with instructions operative when loaded into an SMS router to cause the SMS router, in use, to recognise incoming text messages to one or more SMS Hosts and to direct said text messages to the SMS Host by way of a designated path.

15 The invention will now be further described, by way of example only, with reference to the drawing.

#### **Brief Description of the Drawing**

Figure 1 is a schematic of a telecommunications services apparatus in accordance with the invention.

#### **20 Description of Preferred Embodiments**

With reference to Figure 1, a mobile originated (MO) text message is sent from sender [1] via MSC [2]. The network is configured so that all MO traffic passes through an SMS Router [3]. The SMS Router is operable to attempt direct delivery of person-to-person traffic to the MSC/VLR [4] on

which the destination mobile station [5] is currently registered. The SMS Router is also operable to direct undelivered person-to-person traffic via the SMSC [6] for store and forward. The SMS Router is further operable to groom traffic that is destined for SMS Hosts in the network and to transmit  
5 them directly to the SMS Hosts [7]. The bandwidth of the signalling route [2]-[3]-[7] is potentially large, and is much larger than the bandwidth capability of the SMSC route. The SMS Router is also capable of accepting traffic from other networks [8] using a Virtual Mobile technique.

We consider that reverse billing is the wrong model for sustained SMS  
10 growth in premium rate services due to its incentive to abuse by service providers and the potential to make subscribers increasingly mistrustful of SMS charges. We consider that the only satisfactory billing method is MO billing, with a defined premium where appropriate. For high volume messaging applications this cannot be sustained via SMSCs, since SMSCs  
15 are designed for store and forward, and generally have limited throughput. This causes delays at best, and loses messages at worst.

In a preferred embodiment the premium for a text message would be deducible (within limits) from the destination number, as for voice premium rate. The numbering plan would also identify the destination as an  
20 SMS Host application.

The grooming operation is performed by the SMS Router, which may be implemented as one or a cluster of units, and which may be geographically dispersed. The SMS Router examines each arriving MO message (or MT message from other networks by Virtual Mobile) and decides on the basis  
25 of addressing information and/or content that the message is destined for a particular SMS Host. The SMS Host may be associated with this network, or may associated with a competing network but be reachable over an

interconnect. These messages are groomed off from the normal traffic and transmitted directly towards the SMS Hosts. The interface to the SMS Hosts may be MAP over SS7, SMPP over TCP/IP or other transport means.

- 5 This model supports free-text, premium text, voting and other high volume applications, allowing the network to generate revenue by responding quickly to market demands.

10 With such a grooming solution, network operators retain control of premium charging, whereas with reverse billing the responsibility for fair and reasonable usage falls to the service providers. Maximum benefit from grooming is obtained when all networks in a national or geographic area groom, and there is no throughput restriction. SMS Hosts may have a connection to each operator in a geographic area, or alternatively the operators in that area may support interconnects so that an SMS Host may  
15 be reached directly from other local networks.

## Glossary

EMS	Enhanced Messaging Service
MAP	Mobile Application Protocol
MMS	Multimedia Messaging Service
MO	Mobile Originated
MSC	Mobile Switching Centre
MT	Mobile Terminated
SMPP	Short Message Peer to Peer protocol
SMS	Short Message Service of the GSM mobile telephone system
SMS Host	Equipment for sourcing and sinking Short Messages for specific applications
SMS Router	Equipment which embodies the invention and filters and responds to certain text messages.
SMSC	Short Message Service Centre
SS7	CCITT Signalling System no 7
TCP/IP	Transmission Control Protocol/Internet Protocol. A well known internet data protocol.
VLR	Visitor Location Register

## CLAIMS

1. A telecommunications services apparatus capable of processing text messages some of which are addressed to an SMS Host, as hereinbefore  
5 defined, capable of terminating high volumes of text messages, the apparatus being provided with one or more SMS routers to which all incoming text messages are passed, a first path being provided between the SMS routers and the SMS Host, and an alternative path being provided  
10 between the SMS routers and other destinations, the SMS router/s being configured to recognise incoming text messages to one or more specified SMS Hosts and to be operative to direct such text messages to the SMS Host by way of the first path, and without passing via an SMSC.
2. A telecommunications services apparatus as claimed in claim 1 in  
15 which the first path has a relatively high band width compared with the band width of the alternative path.
3. A telecommunications services apparatus as claimed in claim 1 or claim 2 so arranged as to apply a premium charging rate to text messages directed to an SMS Host.
4. A telecommunications services apparatus as claimed in any one of the  
20 preceding claims in which there is a plurality of the SMS routers and they are geographically dispersed.
5. A telecommunications services apparatus according to any one of the preceding claims in which the SMS router/s is/are configured to direct the text messages to the first path in dependence upon the destination number  
25 or content of a message.

6. A telecommunications services apparatus as claimed in any one of the preceding claims and which is so configured as to be capable of accepting text message traffic from other networks using a virtual mobile technique.
7. A telecommunications services apparatus substantially as described  
5 herein with reference to the accompanying drawing.
8. A method of managing text messages in a telecommunications services apparatus comprising determining from the attributes of a text message whether or not the text message is of a specified character appropriate to be received by an SMS Host, and if the message is determined to be of that  
10 character, directing the text message by a first path to the SMS Host, but otherwise directing the message to a destination by way of an alternative path.
9. The method of claim 8 in which the alternative path has an associated SMSC for use in the event that immediate delivery is not possible.
- 15 10. The method of claim 8 or claim 9 in which the first path has a relatively high band width compared with the band width of the alternative path.
11. The method of any one of claims 8 to 10 further comprising the step of generating a billing instruction which results in a premium rate charge  
20 being applied in the event that it was determined that the message was for delivery to an SMS Host for which a premium rate has been set.
12. A method of managing text messages in a telecommunications services apparatus substantially as described herein with reference to the accompanying drawing.

13. A machine readable storage medium encoded with instructions operative when loaded into an SMS router to cause the SMS router, in use, to recognise incoming text messages to one or more SMS Hosts and to direct said text messages to the SMS Host by way of a designated path.

- 5 14. A machine readable storage medium as claimed in claim 12 in which the instructions are operative to cause a premium rate charging instruction to be generated when the call has been routed to an SMS Host.

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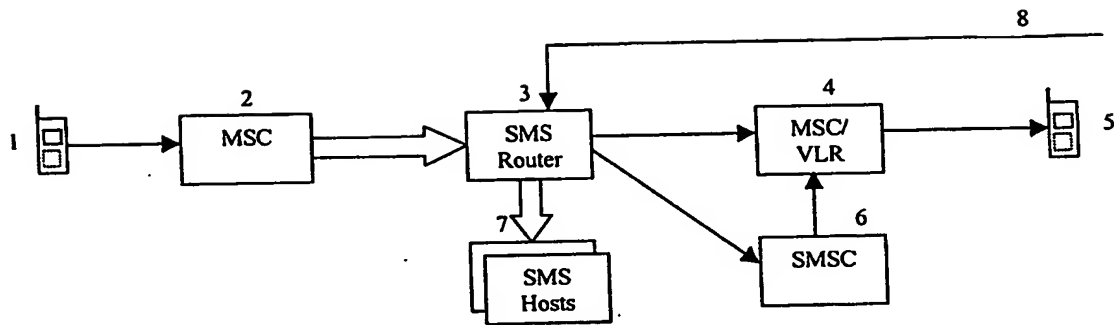


FIGURE 1



PCT Application

**GB0303712**



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